1044b UIC - EAST POPLAR OIL FIELD
ENFORCEMENT CASE SDWA 1431
Folder ID: 13664 1999 Privileged

Release in Full

PRODUCTION DEPT
FILE COPY

MURPHY CORPORATION, ET AL.

EAST POPLAR UNIT WELL NO. 24

ROOSEVELT COUNTY, MONTANA

PRODUCTION DEPT
FILE COPY

PRODUCTION DEPT.
FILE COPY

HURPHY CORPORATION, ET AL

EAST POPLAR UNIT WELL NO. 24

C SW SW Section 12, Township 28N, Range 51E
Roosevelt County, Montana

Elevation 2179' K.B.

MURPHY CORPORATION

EAST POPLAR UNIT WELL NO. 24

LOCATION: 660' north of the south line and 660' east of the west line, SW/4 SW/4 Section 12, Township 28N, Range 51E, Roosevelt County, Montana

ELEVATION: 2166 Ground; 2179 K.B.

SPUDDED: May 6, 1953

COMPLETED: June 23, 1953

TOTAL DEPTH: 5939' Schlumberger; 5938' Driller

May 6 : Spudded well at 4:00 AM. Drilled 12¼" hole to 910'.

May 7 : Drilled 12 ¼" hole to a T.D. of 1010 feet. Ran Schlumberger E.S. Set 987.20 feet of 9 5/8" casing at 1000.20 feet. Cemented with 400 sacks of Ideal bulk cement. Plug down at 4:15 PM.

May 8 : Waiting on cement.

May 9 : Started drilling plug at 2:00 PM. Started drilling 8 3/4" hole at 8:15 PM. Drilled from 1010 feet to 1680 feet.

May 9 to 26: Drilling 8 3/4" hole from 1680 feet to 5409 feet. Strapped pipe at 3609 feet with no correction; strapped pipe at 4820 feet with no correction.

May 26: Drilled from 5409 feet to 5508 feet. Started out of hole to run Schlumberger.

May 27: Ran Schlumberger E.S. Schlumberger T.D. = 5509'. Drilled from 5508 feet to 5600 feet. Started coring at 5600 feet with 7 7/8" Diamond Bit. Cored to 5601 feet.

May 28: Finished cutting and pulled Core #1, 5600-5635 feet. Recovered 19 feet. Started cutting Core #2, cored to 5637 feet.

HISTORY

May 29:	Finished cutting and pulled Core #2, 5635-5645 feet. Recovered 9½". Ran DST #1 with Halliburton Tool. Went in hole with 7 7/8" rock bit and drilled to 5668 feet.
May 30:	Drilled to 5720 feet. Started cutting Core #3 at 5720 feet, and cored to 5748 feet.
May 31:	Finished cutting and pulled Core #3, 5720-5776 feet. Recovered 56 feet. Ran DST #2 with Halliburton Tool.
June 1:	Ran DST #3 with Halliburton Tool; drilled 7 7/8" hole from 5776 to 5866 feet
June 2:	Drilled 7 7/8" hole from 5866 to 5880 feet. Started cutting Core #4 at 5880 feet. Cored to 5908 feet.
June 3:	Finished cutting and pulled Core #4, 5880-5930 feet. Recovered 58 feet. Ran DST #4 with Halliburton Tool.
June 4:	Pulled test tool out of hole and ran Schlumberger E.S. and Microlog. Started laying down drill pipe.
June 5:	Finished laying down drill pipe and set 5926.85 feet of 5½" casing at 5938 feet with 250 sacks Halliburton Pozmix cement.
June 6 to 8:	Waiting on cement.
June 8:	Ran McCullough Radioactivity Log and perforated.
June 9 to 27:	Well undergoing completion operations as set forth under "Completion".

HISTORY OF E.P.U. NO. 24

July 17, 1953

May 6, 1953: 100 feet. Drilling. Spudded in at 4:00 A.M., 5-6-53.

May 8, 1953: 1010 feet. Ran Schlumberger. Ran 30 joints (987.20') 9 5/8 inch, 36#, J-55, 8 rd. thd. R-2 & 3 National Casing; landed 13.00' below RKB, with Larkin Float Shoe at 1000.20', 2 HOWCO centralizers at 848' and 985', 5 B & W Scratchers at 120', 130', 850', 930' and 942'. Cemented with 400 sacks Ideal bulk cement, 15 to 16 lbs. slurry. Clean cement back to surface. Bumped plug with 1050#. Released pressure; held okay. Plug down at 4:15 P.M., 5-7-53. W.O.C.

May 29, 1953: 5645 feet. Preparing to DST #1, from 5606 to 5616. Pulled Core No. 1 from 5600 to 5635. Recovered 19 feet: 6 feet anhydrite and 13 feet limestone with show. Pulled Core No. 2 from 5635 to 5645. Recovered 9½ feet: 3½ feet colitic limestone with show, 5½ feet anhydrite and 6 inches dolomite.

May 30, 1953: 5706 feet. Drilling dolomite and shale streaks. DST #1 with Halliburton, 5606 to 5616, with straddle packers; 5/8 inch bottom choke, no w.c. Open tool at 11:05 A.M. for 2 hours; closed 20 minutes. Open with fair bubble for 30 minutes, very weak bubble 45 minutes, dead last 45 minutes of test. Recovered: 10 feet rat hole mud. IBHFP: 0 FBHFP: 0 BHSIP: 0 Hydro: 3470#.

June 1, 1953: 5776 feet. Cut and pulled Core #3, 5720-5776. Recovered 56 feet: 28' anhydrite and dolomite, no show; 9' limestone, fair show; 9' anhydrite, no show; 10' limestone, fair show. DST #2 with Halliburton, 5742-5757, with straddle packers; 5/8" bottom choke, no w.c. Open tool at 2:25 P.M., 5-31-53 for 4 hours; closed 20 minutes. Opened with very weak blow; continued throughout test. Recovered: 10 feet free oil, 186' muddy salt water with trace of gas. Chl. 85,000 PPM. IBHFP: 0 FBHFP: 65# BHSIP: 2230# Hydro: 3212#. Bottom packer held okay. DST #3 with Halliburton, 5761-5776; 5/8" bottom choke, no w.c. Open tool at 11:55 P.M., 5-31-53 for 4 hours; closed 20 minutes. Open with very weak blow increasing to strong blow by end of test. Recovered: 270' muddy salt water with trace of gas, 1830' black sulphur water. Chl. 110,000 PPM. IBHFP: 240# FBHFP: 965# SIBHP: 2380# Hydro: 3212#.

June 4, 1953: 5938 feet. Running Schlumberger. Pulled Core #4, 5880-5938; recovered 57': 11' limestone, no show; 5' dolomite, no show; 19' limestone, no show; 9' limestone, slight show; 13' limestone, no show. Ran DST #4, 5913-5938; 5/8" bottom choke, no w.c. HOWCO formation packer set at 5913. Tool open at 6:50 P.M., 6-3-53, with weak blow of air which increased to good blow. Tool open 3 hours; shut in 20 minutes. Recovered: 270' gas, 150' slightly oil and gas cut mud, 270' muddy water with oil show and sulphur odor. Ch. 31,000 PPM. IBHFP: 65# FBHFP: 125# SIBHP: 2975# Hydro: 3420#.

June 5, 1953: 5939 feet Schlumberger equals 5938 feet Driller. Ran 151 joints (5926.85') 5½", 15.50#, J-55, 8 rd. thd. Rge. 3 American casing; landed 11.60' below RKB with HOWCO float collar at 5896.09 and HOWCO guide shoe at 5938. Placed HOWCO centralizers at 5665, 5807, and 5933. Placed HOWCO Roto-Wall scratchers at 5499-5504, 5514-5524, 5731-5746, 5756-5766, 5777-5797, 5847-5852, 5860-5865, 5902-5912, 5919-5929. Cemented with 250 sacks HOWCO Pozmix "A" with 2% gel, 13.6 to 13.8 slurry. Bumped plug with 1175#; released pressure and held okay. Pipe rotated freely throughout cementing. Plug down at 10:38 A.M., 6-5-53. W.O.C. Note: Pipe set on Schlumberger measurements.

June 9, 1953: 5935' PBTD. Perforated C Zone, 5913-5920, 4 jet shots per foot. Ran Junk Basket on W.L. Acidized C Zone, 5913-5920, with 500 gallons, 15% regular Dowell acid. Maximum pressure 5000#. Displaced 7 barrels at 1 barrel per minute at 4300#; dropped to 2200#. Displaced 5 barrels at 1 1/4 barrels per minute at 2700#. Final pressure 2200#. Turned to pit at 7:20 P.M. Flowed acid to surface 45 minutes, flowed light heads of acid water for 35 minutes, dead 9:00 P.M. to 10:30 P.M. Started flowing light heads of acid water with trace of oil; dead 2:00 A.M. to 5:00 A.M., 6-9-53. Started swabbing at 5:00 A.M. to 8:00 A.M. Swabbed salt sulphur water with trace of oil. Swabbing down to 1800' at 10 barrels per hour. Chl. 30,000 PPM.

June 10, 1953: 5935 feet PBTD. Swabbing 24 hours at rate of 7 to 10 barrels fluid per hour, 96 to 100% salty sulphur water. Fluid level while swabbing 3000'. Fluid showing slight increase in gas.

June 11, 1953: 5935 PBTD. Swabbing machine broke down for 12 hours. Top of fluid in tubing found at 3768. BHP after 12 hour calculated at 1760#; BHP previously at 2975#. Re-acidized perforations, 5913 to 5920, with 1500 gallons; displaced 2 BPM. Pressure built from 1800 to 3400#. No formation break down indicated. Flowed acid back to surface in 15 minutes, strong blow of spent acid for 20 minutes, weak heads for 30 minutes, dead for 4 hours. Swabbed 3 hours, 98% water with fluid level lowered to 2500'.

May 12, 1953: 5935 feet PBTD. Swabbing 7:00 A.M. to 5:00 P.M., 2 to 4 barrels per hour, 99 to 100% water. Fluid level 4000'. Stratafraced C Zone, 5913-5920, with 1000 gallons gel acid and 2000 gallons 15% regular Dowell acid. Displaced 5½ barrels per minute at 3000#; 4 barrels per minute at 3700# maximum pressure. Pressure after acidizing 3000#. Opened to pit. Flowed displacement water out 6 minutes spent acid 30 minutes and died. Swabbed 11 hours, 2 to 4 barrels per hour, 98 to 100% water. Chl. 40,000 PPM. Fluid level 4000'.

June 13, 1953: 5935 feet PBTD. Swabbing 10 hours, 2 to 3 barrels fluid per hour, 95 to 100% water. Fluid level at 4200'. Re-acidized C Zone, 5913 to 5920, with 2000 gallons gelled channel acid and 4000 gallons 15% regular B-J acid, followed with 4000 gallons crude oil. Displaced gel and regular acid, 5 barrels per minute at 2800 to 3200# pressure. Oil 3 barrels per minute, 3200 to 3900#. Maximum pressure 3900#; blod down pressure after job completed 3200#. Opened to pit at 11:50 P.M. Flowed clean displacement oil 15 minutes, oil and spent acid water 45 minutes, dead 90 minutes. Flowed by heads 20 minutes, then died. Swabbed 4 hours. Fluid 92 to 94% water. Fluid level at 2800'.

June 14, 1953: 8562 feet PBTD. Flowed acid to surface 41 minutes. Flowed spent acid 24 minutes, than died. Started swabbing at 9:15 A.M. Swabbed down to 2800', 3 trips with swab. 4 trips with swab found fluid at 1200', salt water with slight trace of oil. Chl. 106,000 PPM.

June 15, 1953: 5935 PBTD. Ran Model "K" cast iron cement retainer on tubing, set at 5882. Squeezed perforations, 5913 to 5920, with 25 sacks slo-set and 25 sacks regular cement. Maximum pressure 1700#; held 1500#. Squeezed 38 sacks out, 6 sacks left in pipe-20' above retainer, reversed out 6 sacks. PBTD 5862. Perforated B-2 Zone, 5765 to 5770, 4 bullets per foot. Ran Baker Junk Basket on W.L. Ran Baker PT tool set at 5755. Bottom tail pipe 5766. Acidized B-2 Zone, 5765 to 5770, with 1000 gallons 15% regular Dowell acid. Broke formation 5200# to 3800#. Displaced 1.6 barrels per minute at 3800#; back to 3300#. Final pressure 2500#.

June 16, 1953: 5862' PBTD. Stopped swabbing 3 3/4 hours. Started flowing 1/2" stream of salt sulphur water, no show of oil. Pulled tubing. Ran Baker Model "K" cement retainer on tubing, set at 5759. Squeezed B-2 Zone, 5765 to 5770, with 50 sacks slo-set cement. Breakdown pressure 0. Squeezed out 30 sacks. Maximum pressure 3700#, held 3500#. Reversed out 20 sacks cement. PBTD 5758'. Job complete at 9:15 P.M., 6-15-53. Perforated B-1 Zone, 5747 to 5755, 4 bullets per foot. Ran Baker PT Tool set at 5730. Bottom tail pipe at 5741. Acidized B-1 Zone, with 1000 gallons. Break-down pressure 5200#, dropped to 4800#. Displaced 1 1/2 barrels per minute at 4800#, back to 3800#, built up to 4100#. Pressure bled down to 3900#. Opened to pit. Flowed small stream of flush oil for 3 hours and died. Started swabbing at 8:00 A.M. Swabbed 15 barrels displacement oil in 5 trips. Fluid level at 4000'. Swabbed spent acid water down to 5000'. Last trip swabbing from 5100'. Recovered 150' acid water. Shut down swabbing unit to change lines.

June 17, 1953: 5758 feet PBTD. Changed swab line. Started swabbing 9:00 P.M. Swabbed out spent acid. Swabbed to bottom last trip. 100 feet fluid in hole. Stratafraced B-1 Zone, 5747 to 5755, with 1000 gallons gel acid and 2000 gallons 15% regular Dowell acid. Maximum pressure 4600#. Final pumping pressure 4200#. Maximum displacement 4 barrels per minute, minimum 2 barrels per minute. Opened to pit. Flowed small stream displacement water 1:45 A.M. to 5:00 A.M. Started swabbing 6:00 A.M. Swabbed dry by 9:00 A.M.

X

June 18, 1953: 5758 feet PBTD. 8:00 A.M. to 6:00 P.M., swabbed spent acid water. 6:00 A.M. to 10:00 P.M., changed swabbing units. 10:00 P.M. to 8:00 A.M., swabbed 1 to 2 barrels per hour, 90 to 95% salt water. Chl. 150,000 PPM. Fluid level 4500' after 45 minute interval between trips with swab from bottom.

June 19, 1953: 5758 feet PBTD. Swabbed 8:00 A.M. to 3:00 P.M. 1 to 2 barrels per hour, 90 to 95% salt water. Packer failed. Pulled tubing. Ran new Baker PT tool set at 5731. Re-stratafraced B-1 Zone, 5747-5755, with 2000 gallons gel acid, 4000 gallons 15% regular Dowell acid, followed with 4000 gallons crude oil. Maximum pressure 4800#; minimum 4400#. Displaced with two pump trucks, 2.5 to 7 barrels per minute. Bled down to 4200#. No break. Opened to pit at 12:05 A.M. Flowed flush oil 4 hours, decreased to 1/2" stream. Swabbed flush oil 2 hours. Swabbed acid and flush oil 2 hours. Swabbing off bottom.

June 20, 1953: 5680 feet PBTD. Preparing to test A Zone. Swabbed B-1 Zone off bottom, 8:00 A.M. to 6:00 P.M., 1 barrel per hour spent acid water and flush oil. Pulled tubing, ran Baker Junk Basket on W.L. Set Baker Model K Bridge plug on W.L., set at 5684 with 8/10 sacks regular cement on top of plug with wire line dump bailer. PBTD 5680. Perforated A Zone with McCullough, 5605 to 5613, 4 jet shots per foot. Ran Baker Junk Basket on Wire line.

June 21, 1953: 5680' PBTD. Ran Baker PT Tool set at 5630. Tested plug at 5685' with 3000#; held okay. Re-set tool at 5599'. Acidized A Zone, 5605-5613, with 1000 gallons 15% regular Dowell acid. Broke formation with 4400# pressure. Displaced only 150 gallons in formation; pressure dropped to 1000#. Flowed out 150 gallons displacement water, 850 gallons fresh acid, 150 gallons spent acid 14 minutes, oil and salt water 16 minutes. Chl. 110,000 PPM. Shut in 30 minutes. SIP: 475#. Opened in test tank at 5:30 P.M. 30 minutes, OF, 65.10 barrels fluid, 70% water, FP: 0. 3 hours, 14/64 inch choke, 85.10 barrels fluid, 66% water, FP: 325#. 6 hours, 11/64 inch choke, 88.10 barrels fluid, 66% water, FP: 375#. 1 hour, 7/64 inch choke, 8.13 barrels fluid, 65% water, FP: 450#. Packer rubber failed. Preparing to pull tubing.

June 22, 1953: 5680' PBTD. Swabbing. Small flow of oil cut mud through casing. Released PT tool. Flow increased. Conditioned mud to 10.1#. Pulled tubing. Ran 182 joints (5598.75') 2 3/8", E.U.E. 4.70#, J-55, 8 rd. thd. Rge. 2 American tubing with 3.35' perforated sub bull-plugged on bottom; landed 9.08' below RKB spaced as following:

Landed below RKB	9.08'
top joint	31.25'
181 joints	5567.50'
Perf. sub bull-plugged	3.35'
Bottom of tubing	5611.18'

Displaced mud with water. Opened to pit at 2:45 A.M. Flowed very small stream of wash water, 2 hours, with slow steady increase in volume. Swabbed 1 ½ hours, wash water with trace of oil.

June 23, 1953: 5680 feet PBTD. Swabbing. Swabbed 24 hours, 10 to 12 barrels fluid per hour, 85 to 95% water and mud. Chl. 90,000 PPM. (NOTE: 30 minute test, open flow, 39.33 barrels fluid, 70% water not 65.10 barrels fluid).

June 24, 1953: PBTD 5680 feet. Swabbed 24 hours, 8 to 10 barrels fluid per hour, 80 to 90% water and mud. Fluid level 3500 feet. Released rig at 1:00 P.M., 6-23-53.

June 25, 1953: PBTD 5680. Swabbing. Swabbed 8 to 10 barrels per hour, 50 to 80% water. TSIP: 450# CSIP: 850# Well will flow by small heads.

June 26, 1953: PBTD 5680. Testing. Displaced 15 barrels crude oil in A Zone, 5605 to 5613, at 2250# pressure. Opened to test tank. Flowed 16 barrels displacement oil 2 hours, died to weak heads. Re-acidized A Zone with 200 gallons Dowell mud acid with 2 barrels oil ahead of acid. Displaced oil at 2100#; acid at 1900#. Bleed down 600#. Opened to pit. Flowed spent acid 15 minutes. 30 minute test, open flow, 27.13 barrels fluid, 70% salt water. TSIP: 450# CSIP: 900#

June 27, 1953: PBTD 5680 feet. Testing. 4 hours, 14/64 choke, 63.74 barrels fluid, 75% water. TFP: 280# CP: 875#. 14½ hours, 11/64 choke, 201.81 barrels fluid, 64% salt water, TFP: 350# CP: 925#.

June 28, 1953: PBTD 5680 feet. Shut in to build tank battery. Flowed 9.11 barrels fluid per hour, 65% water, 9/64 inch choke, TFP: 350# CP:950# TSIP: 450#. To drop from reports.

EAST POPLAR UNIT NO. 24
SUPPLEMENT TO WELL HISTORY

9-29-99	Kill tubing with heavy treated water
9-30-99	Move in and rig up pulling unit. Start laying down tubing.
10-1-99	Finish laying down tubing. Set Cast Iron Bridge Plug @ 5560'. Dump 4 sacks cement on top of plug.
10-6-99	Run M.I.T.. Pressure casing to 300#, held for 30 minutes. Test witnessed by Irene Harris with the BLM.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit K Battery and Wells EPU Nos. 20, 24, & 100

The East Poplar Unit K Battery and the wells producing into the battery, EPU Nos. 20, 24, & 100, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit K Lease is Murphy Oil Corporation located at P. O. Box 547, Poplar, Montana 59255. The corporate headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas, 71730.

The battery consists of a 8' x 27' vertical separator, a circulating pump with appropriate lines, and two 1,000 barrel galvanized bolted tanks. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks. An earthen pit of about 12,000 barrels capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.

The EPU No. 24 is a flowing well. The EPU Nos. 20 and 100 are pumping wells. There are 4' x 4' x 2' cellars at each wellhead with overflow lines to earthen pits capable of holding a full days fluid production in case of a leak at the well site.

The field flow lines and the well casing of each well are cathodically protected. The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The facilities are about 3 miles from Poplar River. The terrain dips gently East. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 12,000 barrel pit at the tank battery and the well cellars and overflow pits are sufficient secondary containment for these facilities.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit K Battery and Wells EPU Nos. 20, 24, & 100

The East Poplar Unit K Battery and the wells producing into the battery, EPU 20, 24 and 100, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The battery consists of a 8' x 27' vertical separator, a circulating pump with appropriate lines, and two 1,000 barrel galvanized bolted tanks. An earthen pit of about 12,000 barrel capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.

The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit K Lease is Murphy Oil Corporation located at P.O. Box 547, Poplar, Montana 59255. The corporation headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas 71730.

The foreman, Mr. Gerald Hagadone, is responsible for oil spill prevention at this facility. On each trip to the lease the pumper makes a visual inspection of all facilities and reports any malfunction to the foreman, Mr. Gerald Hagadone, and notes this malfunction on the ten day gauge report. There has been no reportable oil Spill Event during the twelve months prior to January 10, 1974.

The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The field flow lines and the well casing of each well are cathodically protected.

Personnel are properly instructed in the operation and maintenance of equipment to prevent oil discharges, and applicable pollution control laws, rules and regulations. Each employee is given these instructions by the field foreman when they are employed. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan. The procedures are reviewed every six months by the field foreman with each employee. When changes occur in procedures, each employee is informed.

Fluid in the 12,000 barrel storage pit is pumped to the salt water disposal unit if the water is brackish as determined by chloride tests. If only fresh water is contained in the pit it is disposed of by placing on lease roads to control dust and compact the roads. Any oil in the pit is pumped back through the separator with the water being sent to the disposal well. Oil skims are burned by state permits. There are no outlets from the storage pit and all fluids must be pumped out.

The two 1,000 barrel tanks are galvanized and are bolted construction. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks.

The EPU No. 24 is a flowing well. The EPU Nos. 20 and 100 are pumping wells. There are 4' x 4' x 2' cellars at each pumping wellhead with overflow lines to earthern pits capable of holding a full days fluid production in case of a leak at the well site.

The facilities are ~~over~~ about 3 miles from the Poplar River. The terrain dips very gently East. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 12,000 barrel pit at the

tank battery and the well cellars and overflow pits are sufficient secondary containment for these facilities.

The tanks are observed daily by the pumper. Periodically, the foreman checks the entire tank battery and producing wells closely. If any trouble is suspected, the facility is shut down, the tanks and/or separator are emptied and cleaned. The facility is then thoroughly inspected by service company personnel, repairs are made if needed and the unit is placed back into service.

Produced salt water is pumped to a field gathering system for injection into a salt water disposal well. The above ground facilities are observed daily by the pumper and inspected by the foreman closely on his visits to the lease.

All salt water disposal flowlines are cement asbestos lines. These lines are buried and the surface is observed daily by the pumper.

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature _____

Name _____

Title _____

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

_____
Printed Name Of Registered Professional Engineer

_____
Signature Of Registered Professional Engineer

(Seal)

Date_____

Registration No. _____ State_____

Contingency Plans For An Oil Discharge

East Poplar Unit K Battery and Wells EPU Nos. 20, 24, & 100

The field is visited twice daily by the pumper. Visual inspection is made on each facility on each visit to determine if any malfunction is occuring. The most likely potential oil discharges are checked thoroughly. Periodically, the field foreman, Mr. Gerald Hagadone, will conduct a close check of the entire facility.

The pumpers, Mr. Ferdinand Charette and Mr. Robert Atkinson, have been instructed in the operations and maintenance of equipment to prevent oil and water discharges and informed of the applicable pollution control laws, rules and regulations. If an oil discharge occurs, the pumper will immediately close the proper valves and/or shut down the production facility to stop the discharge. He will then call Mr. Gerald Hagadone who will in turn inform Mr. Bill Brown, District Superintendent. If needed, the proper state and federal agencies will be notified by Mr. Brown. The discharged oil will be reclaimed or disposed of by approved engineering procedures and in accordance to law.

In the event discharged oil collects on standing water such as a stock pond or rain water standing in a low spot, the oil will be pumped into a tank truck. The skim of oil left on the water will be removed by an oil skimmer owned by Murphy Oil Corporation. The skimmer can be towed to the field within an hours time.

If the discharge is in excess of 50 barrels of oil, the Montana Department of Health and Environmental Sciences in Helena will be notified by Mr. Brown.

If a Spill Event occurs as defined by federal law, the Environmental Protection Agency in Denver, Colorado will be notified by Mr. Brown.

Telephone numbers and personnel to be notified in case of an oil discharge are as follows:

Mr. Ferdinand Charette, Poplar, Montana

Mr. Robert Atkinson, Poplar, Montana

(406) 768-5225

Mr. Gerald Hagadone, Field Foreman, Poplar, Montana

(406) 768-3612 Office

(406) 768-3944 Home

(406) 653-1290 Mobile

Mr. W. G. Brown, District Superintendent, Poplar, Montana

(406) 768-3612 Office

(406) 768-3393 Home

(406) 653-1378 Mobile

Mr. A. W. Simpson, El Dorado, Arkansas

(501) 862-6411 Office

(501) 862-2393 Home

Montana Department Of Health and Environmental Sciences - Helena

(406) 449-2406

(406) 245-3061 (Billings, Montana)

Environmental Protection Agency, Denver, Colorado

(303) 837-3880

(303) 837-2468

Oil Field Construction Service Company, Poplar, Montana

(406) 768-3843 Office

(406) 773-2173 Mobile

MURPHY
EXPLORATION & PRODUCTION COMPANY

131 SOUTH ROBERTSON STREET
P.O. BOX 61780
NEW ORLEANS, LA 70161-1780
(504) 561-2811

April 1, 1996

OVERNIGHT MAIL

Bureau of Land Management
Miles City District Office
111 Garryowen Road
Miles City, Montana 59301-0940

Attn: Mr. Russel Hampton
406-232-7001

RE: **East Poplar Unit (EPU)**
Shut-in Wells
BLM #3160
Roosevelt County, Montana

Dear Mr. Hampton:

This is written as a follow-up to our February 9 letter and pursuant to your recent telephone conversation with Bruce MacArthur of our office. As you know, we have 9 wells that, with a few exceptions, we desire to hold in their current shut-in status. The fluid levels inside their casings are either at or close to the surface. However, as can be seen by the attached wellbore schematics all wells, except EPU #65, have surface casing set (±1000') through the Judith River Formation.

EPU #22 has a packer set at 5877' just above C-2 perforations 5882.5-87.5'. A 500 psig pressure test has been performed on the 2-3/8" X 5½" annulus proving the casing has mechanical integrity. The test was performed during February 1996.

We currently have no further use for E.P.U. #28. Therefore, we propose to permanently plug and abandon the well during the summer. We agree to submit a plugging plan by May 1 and P&A the well within 60 days of plan approval.

As the surface casing of EPU #65 is only set to 267', we propose to perform a pressure test on the casing to prove mechanical integrity. We plan to test the casing as part of a workover to re-establish production or by setting a cast iron bridge plug above open perforations 5852-58', 5870-76' and 5927-34'. We agree to work on this well within 90 days of this letter, i.e. before June 30.

We are currently evaluating our recent (Oct-Dec 1995) 3-D seismic shoot over the East Poplar Field. To date we have spent about $1,000,000 for the seismic and associated work, and we still plan to drill during the 3rd quarter of this year. Due to our prior commitment to the development of the Unit and upcoming work in the area, we desire to hold the remaining 6 wells in their current status until our

exploration program unfolds. These wellbores may be necessary to fully and economically exploit the exploration and development potential revealed by our 3-D seismic program. Murphy EXPRO therefore requests that we be allowed to retain EPU Nos. 16, 19, 24, 62, 94 and 96 in their current shut-in status for 2 years.

Hopefully the above sufficiently explains our current plans for the EPU and provides you the requested time frame in which we plan to systematically deal with these shut-in wells. It is Murphy's desire to avoid prematurely abandoning useable wellbores that would leave potentially recoverable oil in the ground. We are also aware of and share your concern for not jeopardizing the existing subsurface or surface environment. It is my opinion that the remaining shut-in wells are not jeopardizing the environment and the granting of our request is therefore consistent with the duties and responsibilities of the BLM. If there are any questions concerning our intentions, please write or call me in New Orleans at 504-561-2594.

Yours truly,

Sidney W. Campbell

Sidney W. Campbell
Manager, Onshore Operations

SWC/BDM/ebh

cc: Ray Reede
Poplar District Manager

(EPUSIW1a.SWC)

A.F.E. No. 54-4

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT TANK BATTERY "K" *
NE ¼, SW ¼, Sec. 11, Twp. 28N, Rge. 15E, Roosevelt County, Montana

TANK BATTERY CONSTRUCTION	TOTAL COST
Tanks, two 1000 bbls., galv., bolted steel, comp., erected	$ 5,990
Treater, 8' x 27½', Comp., insulated, & treater house	6,490
Chemical Pump	195
Line pipe, valves, & fittings	2,080
Trucking, dozer work, & other labor	1,905
Total Estimated Cost	$ 16,660

APPORTIONMENT OF TOTAL ESTIMATED COSTS

APPROVAL OF EXPENDITURE

PRODUCTION DEPARTMENT

Requested by_____
Date_____

Approved by_____
Date_____

EXECUTIVE DEPARTMENT

Approved by_____
Date_____

APPROVED

_____

By_____

Date_____

AWS-mbw
7-7-53

* To serve Unit Well No. 24 and additional wells to be drilled in the immediate area

A.F.E. No. 55-412

AUTHORITY FOR EXPENDITURE
SALT WATER DISPOSAL LINES
EAST POPLAR UNIT, ROOSEVELT COUNTY, MONTANA

CONSTRUCTION EXPENSE:	TOTAL COST
*5000' of 3" I.D. heavy wall Craylastic plastic pipe, installed in 3' ditch, tested and backfilled @ $0.87 per ft.	$ 4,350
**6000' of 3" I.D. as described above	5,220
Connections and Supervision	500
TOTAL COST	$10,070

* Connects "K" Battery to "D" Battery disposal pump.

** Connects "H" Battery into the above described line at a point approximately 500' north of Well No. 9.

APPORTIONMENT OF TOTAL COST

	%	
Murphy Corporation - Unit Operator	14.675953	$ 1,478
Marine Oil Company	16.772517	1,689
Munoco Company	2.096565	211
Placid Oil Company	33.545035	3,378
The Carter Oil Company	16.335860	1,645
Phillips Petroleum Company	16.335860	1,645
C. F. Lundgren	.238210	24

APPROVAL OF EXPENDITURE

Production Department

Requested by Harold Milam

Date 10-1-54

Approved by Eastburn

Date 10/22/54

Executive Department

Approved by C. H. Murphy, Jr.

Date 11/1/54

Approved

BUDGET SECTION

By L. R. Beasley

Date 10-26-54

HM:emg
9-30-54

Ref. No. 25

Form 9-331a
(Feb. 1951)

COPY RETAINED DISTRICT OFFICE

Budget Bureau 42-R358.2.
Approval expires 12-31-52.

(SUBMIT IN TRIPLICATE)

Land Office Billings

Lease No. BLM-A-029305-A

Unit East Poplar

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

JUN 11 1953
GEOLOGICAL SURVEY
BILLINGS, MONT.

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	XXX
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

June 8, 1953

Well No. 24 is located 660 ft. from {XXX S} line and 660 ft. from {XXX W} line of sec. 12

SW/4 SW/4 Sec. 12 (¼ Sec. and Sec. No.) | 28N (Twp.) | 51E (Range) | (Meridian)

East Poplar (Field) | Roosevelt (County or Subdivision) | Montana (State or Territory)

Approved JUN 11 1953
H. D. Quigley
District Engineer

The elevation of the derrick floor above sea level is 2179 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Ran DST #4, from 5913-5938; 5/8" bottom choke, no w.c. HOWCO formation packer set at 5913. Tool open at 6:50 P.M., 6-3-53, with weak blow of air which increased to good blow. Tool open 3 hours; shut in 20 minutes. Recovered: 270' gas, 150' slightly oil and gas cut mud, 270' muddy water with oil show and sulphur odor. Chl. 31,000 ppm. IBHFP: 65# FBHFP: 125# SIBHP: 2975# Hydro: 3420#

5939' Schl. equals 5938' Driller. Ran 151 jts. (5926.85') 5½", 15.50#, J-55, 8 rd. thd. Rge. 3 American casing: landed 11.60' below RKB with HOWCO float collar at 5896.09; guide shoe at 5938. Placed centralizers at 5665, 5807, and 5938; scratchers at 5499-5504, 5514-5524, 5731-5746, 5756-5766, 5777-5797, 5847-5852, 5860-5865, 5902-5912, 5919-5929. Cemented with 250 sacks HOWCO Pozmix "A" with 2% gel, 13.6 to 13.8 slurry. Bumped plug with 1175#; released pressure and held okay. Pipe rotated freely throughout cementing. Plug down at 10:38 A.M., 6-5-53

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy Corporation

Address Murphy Building

Poplar, Montana

By Harold Milam

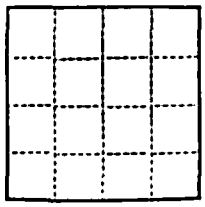
Title District Production Supt.

U. S. GOVERNMENT PRINTING OFFICE 16—8437-4

COPY RETAINED DISTRICT OFFICE

Budget Bureau 42-R358.2.
Approval expires 12-31-52.

Form 9-331a
(Feb. 1951)



(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Land Office Billings
Lease No. BLM-A-029305-A
Unit East Poplar

RECEIVED
JUN 11 1953
U.S. GEOLOGICAL SURVEY
BILLINGS, MONT.

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	XXX
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

June 10, 19 53

Well No. 24 is located 660 ft. from {N/S} line and 660 ft. from {E/W} line of sec. 12

SW/4 SW/4 Sec. 12 (¼ Sec. and Sec. No.) 28N (Twp.) 51E (Range) (Meridian)

East Poplar (Field) Roosevelt (County or Subdivision) Montana (State or Territory)

The elevation of the derrick floor above sea level is 2179 ft.

Approved 6-11-53
H. H. Bennett
District Engineer

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

5939 feet. Nippled up. Tested casing with 1000# for 30 minutes. Picked up tubing. 6-7-53.

5935 feet PBTD. Drilled out cement to 5935. Ran radio-active logs. 6-8-53

Perforated C Zone, 5913-5920, 4 jet shots per foot. Ran Junk Basket on W.L. Acidized C Zone, 5913-5920, with 500 gallons, 15% regular Dowell acid. Maximum pressure 5000#. Displaced 7 bbls. at 1 bbl. per minute at 4300#; dropped to 2200#. Displaced 5 bbls. at 1 1/4 bbls. per minute at 2700#. Final pressure 2200#. Turned to pit at 7:20 PM. Flowed acid to surface 45 min., flowed light heads of acid water for 35 min., dead 9:00 to 10:30 P.M. Started flowing light heads of acid water with trace of oil; dead 2:00 A.M. to 5:00 A.M., 6-9-53. Started swabbing at 5:00 A.M. to 8:00 A.M. Swabbed salt sulphur water with trace of oil. Chl. 30,000 ppm.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy Corporation

Address Box 76

Poplar, Montana

NOTED — DISTRICT

By Harold M. Brown

Title District Production Supt.

U. S. GOVERNMENT PRINTING OFFICE 16—8487-4

SUNDRY NOTICES AND REPORTS ON WELLS

DETAILS OF WORK
(continued)

East Poplar Unit Well No. 24:

5935' PBTD. Swabbing 7:00 A.M. to 5:00 P.M., 2 to 4 barrels per hour, 99 to 100% water. Fluid level 4000'. Stratafraced C Zone, 5913-5920, with 1000 gallons gel acid and 2000 gallons 15% regular Dowell acid. Displaced 5½ barrels per minute at 3000#; 4 barrels per minute at 3700# maximum pressure. Pressure after acidizing 3000#. Opened to pit. Flowed displacement water out 6 minutes, spent acid 30 minutes and died. Swabbed 11 hours, 2 to 4 barrels per hour, 98 to 100% water. Chlorides 40,000 PPM. Fluid level 4000'. 6-12-53

Swabbing 10 hours, 2 to 3 barrels fluid per hour, 95 to 100% water. Fluid level at 4200'. Re-acidized C Zone, 5913-5920, with 2000 gallons gelled channel acid and 4000 gallons 15% regular B-J acid, followed with 4000 gallons crude oil. Displaced gel and regular acid, 5 barrels per minute at 2800 to 3200# pressure. Oil 3 barrels per minute, 3200 to 3900#. Maximum pressure 3900#; bled down pressure after job completed 3200#. Opened to pit at 11:50 P.M. Flowed clean displacement oil 15 minutes, oil and spent acid water 45 minutes, dead 90 minutes. Flowed by heads 20 minutes, then died. Swabbed 4 hours. Fluid 92 to 94% water. Fluid level at 2800'. 6-13-53

5862' PBTD. Ran Model "K" cast iron cement retainer on tubing, set at 5882'. Squeezed perforations, 5913-5920, with 25 sacks slo-set and 25 sacks regular cement. Maximum pressure 1700#; held 1500#. Squeezed 38 sacks out, 6 sacks left in pipe - 20' above retainer, reversed out 6 sacks. Perforated B-2 Zone, 5765-5770, 4 bullets per foot. Ran Baker Junk Basket on W.L. Ran Baker PT Tool set at 5755. Bottom tail pipe at 5766. Acidized B-2 Zone, 5765 to 5770, with 1000 gallons 15% regular Dowell acid. Broke formation 5200# to 3800#. Displaced 1.6 barrels per minute at 3800#, back to 3300#. Final pressure 2500#. 6-14-53

5862' PBTD. Swabbed 24 hours, 100% salt sulphur water, 12 to 15 barrels per hour. Fluid level at 1000 to 1500'. Stopped swabbing 3 3/4 hours. Started flowing 1/2" stream of salt sulphur water, no show of oil. Pulled tubing. Ran Baker Model "K" cement retainer on tubing, set at 5759. Squeezed B-2 Zone, 5765 to 5770, with 50 sacks slo-set cement. Breakdown pressure 0. Squeezed out 30 sacks. Maximum pressure 3700#, held 3500#. Reversed out 20 sacks cement. Job complete at 9:15 P.M., 6-15-53.

5758' PBTD. Perforated B-1 Zone, 5747 to 5755, 4 bullets per foot. Ran Baker PT Tool set at 5730. Bottom tail pipe at 5741. Acidized B-1 Zone, with 1000 gallons. Breakdown pressure 5200#, dropped to 4800#. Displaced 1 1/2 barrels per minute at 4800#, back to 3800#, built up to 4100#. Pressure bled down to 3900#. Opened to pit. Flowed small stream of flush oil for 3 hours and died. Started swabbing at 8:00 A. M. Swabbed 15 barrels displacement oil in 5 trips. Fluid level at 4000'. Swabbed spent acid water down to 5000'. Last trip swabbing from 5100'. Recovered 150' acid water. 6-16-53

Form 2
Rev. 8-92

Submit In Quadruplicate To:
Montana Board of Oil and Gas Conservation
Billings or Shelby Office

ARM 36.22.307, 1003, 1004, 1011, 1013, 1103, 1222, 1301, 1306, and 1309

Sundry Notices and Report of Wells

Received
AUG 10 1999
Board of Oil & Gas Cons.
State of MT

Operator
Murphy Exploration & Production Company

Address
P.O. Box 547

City | State | Zip Code
Poplar | MT | 59255

Telephone Number ( ) | Telefax Number ( )

Lease Name:
East Poplar Unit No. 24

Lease Type (Private/State/Federal):
Federal

Well Number:
No. 24

Unit Agreement Name:
East Poplar Unit

Field Name or Wildcat:
East Poplar

Location of well (1/4-1/4 section and footage measurements):
660' from the South line and 660' from the West line.
SW SW Section 12, T28N, R51E
If directionally or horizontally drilled, show both surface and bottom hole locations)

Section, Township, and Range:
SW SW SEction 12, T28N, R51E

API Number:
25 | 0 | 8 | 5 | 0 | 5 | 0 | 3 | 2
State | County | Well

Well Type (oil, gas, injection, other):
Oil Well

County:
Roosevelt

Indicate below with an X the nature of this notice, report, or other data:

Notice of Intention to Change Plans	☐	Subsequent Report of Mechanical Integrity Test	☐
Notice of Intention to Run Mechanical Integrity Test	☐	Subsequent Report of Stimulation or Chemical Treatment	☐
Notice of Intention to Stimulate or to Chemically Treat	☐	Subsequent Report of Perforation of Cementing	☐
Notice of Intention to Perforate or to Cement	☐	Subsequent Report of Well Abandonment	☐
Notice of Intention to Abandon Well (Temp.)	XX	Subsequent Report of Pulled or Altered Casing	☐
Notice of Intention to Pull or Alter Casing	☐	Subsequent Report of Drilling Waste Disposal	☐
Notice of Intention to Change Well Status	☐	Subsequent Report of Production Waste Disposal	☐
Supplemental Well History	☐	Subsequent Report of Change in Well Status	☐
Other (specify) _____	☐	Subsequent Report of Gas Analysis (ARM 36.22.1222)	☐
_____	☐	_____	☐

Describe Proposed or Completed Operations:
Describe planned or completed work in detail. Attach maps, well-bore configuration diagrams, analyses, or other information as necessary. Indicate the intended starting date for proposed operations or the completion date for completed operations.

A Cast Iron Bridge Plug will be set at 5560' and 4 sacks cement will be placed on top of it. The casing will be tested to 300#.

BOARD USE ONLY

Approved AUG 13 1999
Date

Accepted for record purposes only

Name | Title

The undersigned hereby certifies that the information contained on this application is true and correct:

August 10, 1999 | Raymond Reede
Date | Signed (Agent)

Raymond Reede | District Manager
Print Name & Title

Form 2
Rev. 8-92

Submit In Quadruplicate To:
Montana Board of Oil and Gas Conservation
Billings or Shelby Office

ARM 36.22.307, 1003, 1004, 1011, 1013, 1103, 1222, 1301, 1306, and 1309

Sundry Notices and Report of Wells

Operator
Murphy Exploration & Production Company

Address
P.O. Box 547

City Poplar State MT Zip Code 59255-0547

Telephone Number (406) 768-3612 Telefax Number (406) 768-5497

Lease Name:
East Poplar Unit

Lease Type (Private/State/Federal):
Federal

Well Number:
No. 24

Unit Agreement Name:
East Poplar Unit

Field Name or Wildcat:
East Poplar

Section, Township, and Range:
SW SW Section 12, T28N R51E

County:
Roosevelt

OCT 1999
Received
Board of Oil & Gas Cons.
State of MT / Billings

Location of well (1/4-1/4 section and footage measurements):
660' from the South line and 660' from the West line
If directionally or horizontally drilled, show both surface and bottom hole locations)

API Number:
25 [redacted] 085 [redacted] 05032
State County Well

Well Type (oil, gas, injection, other):
Oil Well

Indicate below with an X the nature of this notice, report, or other data:

Notice of Intention to Change Plans	☐	Subsequent Report of Mechanical Integrity Test	☐
Notice of Intention to Run Mechanical Integrity Test	☐	Subsequent Report of Stimulation or Chemical Treatment	☐
Notice of Intention to Stimulate or to Chemically Treat	☐	Subsequent Report of Perforation of Cementing	☐
Notice of Intention to Perforate or to Cement	☐	Subsequent Report of Well Abandonment Temp.	☒
Notice of Intention to Abandon Well	☐	Subsequent Report of Pulled or Altered Casing	☐
Notice of Intention to Pull or Alter Casing	☐	Subsequent Report of Drilling Waste Disposal	☐
Notice of Intention to Change Well Status	☐	Subsequent Report of Production Waste Disposal	☐
Supplemental Well History	☐	Subsequent Report of Change in Well Status	☐
Other (specify) _____	☐	Subsequent Report of Gas Analysis (ARM 36.22.1222)	☐
_____	☐	_____	☐

Describe Proposed or Completed Operations:
Describe planned or completed work in detail. Attach maps, well-bore configuration diagrams, analyses, or other information as necessary. Indicate the intended starting date for proposed operations or the completion date for completed operations.

10-1-99 Set C.I.B.P. at 5560'. Dump 4 sacks cement on top of bridge plug.

10-6-99 Run M.I.T. - Pressure casing to 300#, held 30 minutes. Test witnessed by Irene Harris with the BLM

Change well status from Shut In to Temporarily Abandoned.

FOR INFORMATION PURPOSE ONLY.

BOARD USE ONLY

Approved OCT 21 1999
Date

Accepted for record purposes only

Name Title

The undersigned hereby certifies that the information contained on this application is true and correct:

October 19, 1999 Raymond Reede
Date Signed (Agent)

Raymond Reede District Manager
Print Name & Title

Form 3160-5
(November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

5. Lease Serial No. 1420-256-64047
6. If Indian, Allottee or Tribe Name: Fort Peck
7. If Unit or CA/Agreement, Name and/or No.: East Poplar Unit
8. Well Name and No.: EPU No. 24
9. API Well No.: 25-085-05032
10. Field and Pool, or Exploratory Area: East Poplar Unit
11. County or Parish, State: Roosevelt Montana

1. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other
2. Name of Operator: Murphy Exploration & Production Company
3a. Address: P.O. Box 547 Poplar, MT 59255-0547
3b. Phone No. *(include area code)*: 406-768-3612
4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*: 660' from the South line and 660' from the West line SW SW Section 12, T28N, R51E

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☒ Temporarily Abandon	Set CIBP
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

A Cast Iron Bridge Plug will be set at 5560' and 4 sacks cement will be placed on top of it. The casing will be tested to 300#.

AUG 1999
Bureau of Land Management
Miles City, Montana

14. I hereby certify that the foregoing is true and correct
Name *(Printed/Typed)*: Raymond Reede
Title: District Manager
Signature: Raymond Reede
Date: August 10, 1999

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by: [signature]
Acting Title: AFM - Minerals
Date: AUG 1 1999

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office: See Attached for Conditions of Approval

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)

Form 3160-5
(November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

5. Lease Serial No.
1420-256-4047

6. If Indian, Allottee or Tribe Name
Fort Peck

7. If Unit or CA/Agreement, Name and/or No.
East Poplar

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
EPU No. 24

2. Name of Operator
Murphy Exploration & Production Company

9. API Well No.
25-085-05032

3a. Address
P.O. Box 547
Poplar, MT 59255-0547

3b. Phone No. *(include area code)*
406 768-3612

10. Field and Pool, or Exploratory Area
East Poplar Unit

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
660' from the South line and 660' from the West line
SW SW Section 12, T28N, R51E

11. County or Parish, State
Roosevelt
Montana

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☒ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

10-1-99
Set C.I.B.P. at 5560'. Dump 4 sacks cement on top of bridge plug.

10-6-99
Run M.I.T. - Pressure casing to 300#, held 30 minutes. Test witnessed by Irene Harris with the BLM

Change well status from Shut In to Temporarily Abandoned.

OCT 1999
Bureau of Land Management
Miles City, Montana

14. I hereby certify that the foregoing is true and correct
Name *(Printed/Typed)*
Raymond Reede

Title
District Manager

Signature
Raymond Reede

Date
October 19, 1999

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by
Acting Bernice Knapp

Title
AFM - Minerals

Date
OCT 25 1999

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office
See Attached for Conditions of Approval

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)

OP

Murphy Exploration & Production Company
Indian Lease 14-20-256-4047
East Poplar Unit No. 24
SW SW, Sec. 12, T. 28 N., R. 51 E.
Roosevelt County, Montana

CONDITIONS OF APPROVAL

1. TA status for this well is granted effective October 15, 1999 and will expire October 1, 2000 in accordance with 43 CFR 3162.3-4(c).

2. The well must pass an MIT with no more than a 10 percent drop of pressure over 30 minutes prior to October 1, 2000.

3. The MIT must be witnessed by the BLM. Please call this office at least 24 hours prior to running the test (406-232-7001).

4. Approval to extend the TA status beyond the expiration date must be requested in writing on or before October 1, 2000.

5. Monthly Reports of Operations must continue to be submitted to the MMS. The status of the well must be reported as TA, and the volume of fluids produced should be reported as zero (0) until the well is returned to production.

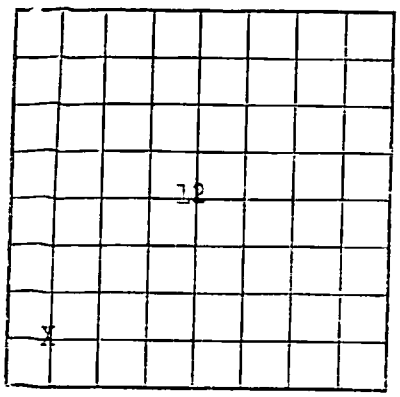
6. If this well is returned to production, this office must be notified within 5 working days via Sundry Notice (Form 3160-5), or orally to be followed by a written confirmation.

Form 9-330

COPY RETAINED IN LAND OFFICE

Budget Bureau No. 42-R355.2.
Approval expires 12-31-52.

U. S. LAND OFFICE Billings
SERIAL NUMBER 31m-A-029305-A
LEASE OR PERMIT TO PROSPECT



LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Murphy Corporation Address Box 76 Poplar

Lessor or Tract East Poplar Unit Field State Montana

Well No. 24 Sec. 12 T. 28N R. 51E Meridian County Roosevelt

Location 660 ft. {N/S} of S Line and 660 ft. {E/W} of W Line of Sec. 12 Elevation 2179
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed

Date July 6, 1953 Title Dist. Prod. Supt.

The summary on this page is for the condition of the well at above date.

Commenced drilling May 6, 1953 Finished drilling June 23, 1953

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from "A" 5606 to 5616 No. 4, from to

No. 2, from to No. 5, from to

No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to

No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
9 5/8"	36#	8 rd. Thd.	Nat'l	987.20	Larkin				
						B-2	5765	5770	
5 1/2"	15.5	8 rd. Thd.	Amer.	5926.85	Howco	C	5913	5920	Oil String
						B-1	5747	5755	
						A	5605	5613	

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
9 5/8	1000.20	400	Pump & Plug		
5 1/2	5938	250	Pump & Plug		

PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set

Adapters—Material Size

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

FOLD | MARK

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 5939 feet, and from ..... feet to ..... feet

Cable tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

DATES

....., 19..... Put to producing ....., 19.....

The production for the first 24 hours was 63.71 barrels of fluid of which 25 % was oil; 175 % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

A. W. Hoptowit, Driller M. O. Saathoff, Driller

N. W. Strain, Driller ....., Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
			Shlumberger Tops
	830		Judith River
	2060		Niabrara
	2230		Carlise
	2411		Greenhorn
	2613		Graneros
	2768		Upper Muddy
	2985		Muddy
	3206		Dakota Silt
	3573		Morrison
	3648		Swift
	3978		Rierdon
	4332		Piper Shale
	4411		Piper Lss.
	4468		Gyp Springs
	4660		Spearfish
	4795		Amsden
	4956		Heath
	5106		Otter
	5247		Kibbey Sd.
	5405		Kibbey Ls
	5500		Madison

(OVER)

FROM— TO— TOTAL FEET FORMATION 16—43094-2

FORMATION RECORD—Continued

ROCKY MOUNTAIN DISTRICT
June 25, 1953
Report by M. T. James

EAST POPLAR UNIT WELL NO. 24

Completion Summary

6-6-53: 5939 feet (Schlumberger). Cut off 5½ inch casing. Started nippling up.

6-7-53: 5939 feet. Nippled up. Tested 5½ inch casing with 1000# for 30 minutes; held okay. Drilled out cement and float collar; float collar at 5892', (Tubing) and 5896' (Schlumberger). Drilled out cement to 5935' (Schlumberger), 5931' (Tubing). Conditioned mud.

6-8-53: PBTD 5935'. Ran McCullough Radiation log. Perforated C Zone, 5913-20, with 4 jet shots per foot. Ran junk basket after perforations. Ran Baker PT Tool set at 5903'. Acidized C Zone with 500 gallons Dowell regular, 15% acid. Maximum pressure 5000#; broke back to 4300#. Displaced 7 barrels at 1 barrel per minute. Pressure dropped to 2200#; built back to 2700# while displacing last 5 barrels at 1¼ barrels per minute. Bled down pressure 2000#. Opened to pit at 7:20 P.M. Acid to surface 45 minutes. Flowed acid by light heads for 35 minutes; dead from 9:00 P.M. to 10:30 P.M. At 10:30 P.M. started making light heads of acid water with trace of oil. Dead from 2:00 A.M. to 5:00 A.M. Started swabbing spent acid water with trace of oil. After 2 hours swabbing, fluid level at 3500', 99% water.

6-9-53: At 8:00 A.M., fluid level 1800'. Swabbing approximately 10 barrels of salt sulphur water with trace of oil. Chlorides 30,000 PPM. Swabbed 24 hours, 96 to 100% salt sulphur water. Fluid level 3000'. Fluid showing slight increase in gas.

6-10-53: PBTD 5935'. Shut down 12 hours while repairing swabbing unit. Reacidized C Zone, 5913-20, with 1500 gallons regular, 15% Dowell acid. Displaced 2 barrels per minute; pressure from 1800# to steady build up of 3400#, no breakdown. Shut down pressure 1800#. Flowed acid to surface 15 minutes, strong flow of spent acid for 20 minutes, weak heads for 30 minutes, dead from 1:00 A.M. to 5:00 A.M. Started swabbing at 5:00 A.M. Fluid level, after 3 hours swabbing, 2500', 98 to 100% water. NOTE: Top of fluid in tubing found at 3768'. BHP after 12 hours calculated at 1760#, previously at 2975#.

6-11-53: PBTD 5935'. Fluid level 4000' after 10 hours swabbing, 2 to 4 barrels per hour, 99 to 100% water. Stratafraced C Zone, 5913-20, with 1000 gallons gel acid and 2000 gallons regular, 15% Dowell acid. Pumped 20 barrels gel acid in tubing before pressure started to build. Displaced 1 barrel of stratafrac material into formation. Minimum pressure 1200#, steady build up in pressure to 3700#. Maximum rate of gel and regular acid displacement 5½ barrels per minute at 3000#, 4 barrels per minute at 3700# minimum. Bled down pressure, after stratafrac job, 3000#. Opened to pit. Flowed out displacement water 6 minutes, spent acid water for 30 minutes, then died. Started swabbing at 8:00 P.M. to 8:00 A.M., 6-12-53. Swabbed 2 to 4 barrels, 98 to 100% gassy water. Chlorides 40,000 PPM. Fluid level 4000'.

6-12-53: Swabbed 10 hours, 2 to 3 barrels per hour, 95 to 100% water. Fluid level 4200'. Reacidized C Zone, 5913-20, with 2000 gallons gelled channel acid, 4000 gallons 15% regular B-J acid, flushed with 95 barrels crude oil. Displaced gelled and regular acid at rate of 5 barrels per minute with 2800# to 3200# pressure. Displaced crude oil at 3 barrels per minute with 3200# to 3900# pressure.

6-12-53 (cont'd): Maximum pressure 3900#; bled down pressure 3200#. Opened to pit at 11:50 P.M. Flowed clean displacement oil 15 minutes, spent acid and oil 45 minutes, dead 90 minutes. Flowed by heads for 20 minutes, then died. Started swabbing 3:20 A.M., 6-13-53. After swabbing 4 hours, fluid 92 to 94% water. Fluid level 2800'.

6-13-53: PBTD 5935'. Swabbed 3 hours, 3 to 4 barrels fluid per hour, 94 to 98% water with acid taste. Pulled tubing and ran Baker Model "K" castiron cement retainer on tubing, set at 5882'. Squeezed perforations, 5913-20, with 25 sacks slo-set and 25 sacks regular cement. Maximum pressure 1700#, held at 1500#. Squeezed 38 sacks out, left 6 sacks 20 feet above retainer. Reversed out 6 sacks. Job completed at 9:15 P.M., 6-13-53. Conditioned mud to 10.3#. PBTD 5862'. Perforated B-2 Zone, 5765-70, with 4 bullets per foot (20 holes). Ran Baker PT tool set at 5754.68' and bottom tail pipe at 5765.84'. Acidized B-2 Zone with 1000 gallons, 15% regular Dowell acid. Broke formation 5200#, back to 3800#. Displaced 1.6 barrels per minute at 3800#, back to 3300#. Bled down pressure after pumping 2500#. Opened to pit at 7:52 A.M., 6-14-53, flowing displacement oil.

6-14-53: PBTD 5862'. Flowed acid to surface 41 minutes, spent acid 24 minutes, then died. Started swabbing at 9:15 A.M. Swabbed down to 2800' 3 trips with swab, 4 trips found fluid at 1200', salt water with slight trace of oil. Chlorides 106,000 PPM. Swabbed 100% salt sulphur water, 10 to 15 barrels per hour. Fluid level 1000' to 1500'.

6-15-53: PBTD 5862'. Stopped swabbing 3 3/4 hours. Started flowing 1/2 inch stream salt sulphur water, no show of oil. Pulled tubing and ran Baker Model "K" cement retainer on tubing, set at 5759'. Squeezed B-2 Zone, 5765-70, with 50 sacks slo-set cement. Break down pressure 0. Squeezed out 30 sacks. Maximum pressure 3700#, held 3500#. Reversed out 20 sacks cement. PBTD 5758'. Job completed at 9:15 P.M., 6-15-53. Perforated B-1 Zone, 5747-55, with 4 bullets per foot. Ran Baker junk basket on wire line; stopped at 5748'. Ran Baker PT tool set at 5730'; bottom tail pipe at 5741'. Acidized B-1 Zone with 1000 gallons 15%, regular B-J acid. Breakdown pressure 5200#, dropped to 4800#. Displaced 1½ barrels per minute at 4800#, back to 3800#, built up to 4100#. Pressure bled down to 3900#. Opened to pit. Flowed small stream of flush oil for 3 hours and died.

6-16-53: PBTD 5758'. Started swabbing at 8:00 A.M. Swabbed 15 barrels displacement oil in 5 trips. Fluid level at 4000'. Swabbed spent acid water down to 5000', last trip swabbing from 5100'. Recovered 150' of acid water. Shut down swabbing unit to change lines.

6-17-53: PBTD 5758'. Changed swab lines. Started swabbing at 9:00 P.M. Swabbed out spent acid, swabbed to bottom. Last trip 100' fluid in hole. Stratafraced B-1 Zone, 5747-55, with 1000 gallons gel acid, 2000 gallons 15% regular Dowell acid. Maximum pressure 4600#; final pumping pressure 4200#. Maximum displacement 4 barrels per minute; minimum 2 barrels per minute. Opened to pit. Flowed small stream displacement water from 1:45 A.M. to 5:00 A.M. Started swabbing at 6:00 A.M. Swabbed dry by 9:00 A.M.

6-18-53: PBTD 5758'. From 8:00 A.M. to 6:00 P.M., swabbed spent acid water; 6:00 P.M. to 10:00 P.M. changed swabbing units, 10:00 P.M. to 8:00 A.M. swabbed 1 to 2 barrels per hour, 90 to 95% salt water. Chlorides 150,000 PPM. Fluid level 4500' after 45 minute interval between trips, swabbing from bottom.

6-19-53: PBTD 5758'. Swabbed from 8:00 A.M. to 3:00 P.M., 1 to 2 barrels per hour, 90 to 95% water, swabbing off bottom. Started swabbing drilling mud. Packer rubber failed. Pulled tubing. Ran new Baker PT tool set at 5731'. Stratafraced B-1 Zone with 2000 gallons gel acid, 4000 gallons regular, 15% Dowell acid, followed with 4000 gallons crude oil. Maximum pressure 4800#. Displaced gel at 4200# to 4500# at rate of 2.5 barrels per minute. Displaced acid at 4600#, 3 to 7 barrels per minute (2 pump trucks). Displaced oil at 4400# to 4800#, bled down pressure 4200#. Opened to pit at 12:05 A.M. Flowed displacement oil until 4:30 A.M., weakened to ½ inch stream. Swabbed oil from 4:30 A.M. to 6:00 A.M. 6:00 A.M. to 8:00 A.M., swabbed spent acid water and oil, swabbing off bottom.

6-20-53: PBTD 5758'. Swabbed off bottom, from 8:00 A.M. to 6:00 P.M., 1 barrel per hour, spent acid water and flush oil. Pulled tubing. Ran Baker junk basket on wire line. Set Baker Model K bridge plug on wire line, set at 5684' with 8/10 sacks regular cement on top plug with wire line dump bailer. PBTD 5680'. Perforated A Zone, 5605-5613, 4 jet shots per foot. Ran Baker wire line junk basket.

6-21-53: PBTD 5680'. Ran Baker PT tool set at 5630'. Tested bridge plug at 5685 with 3000#, held okay. Released tool. Re-set at 5599'. Acidized A Zone, 5605-5613, with 1000 gallons, 15% regular Dowell acid. Broke formation at 4400#. Displaced only 150 gallons in formation, pressure dropped to 1000#. Flowed out 150 gallons displacement water and 850 gallons fresh acid 2½ minutes. Started showing oil 16 minutes, flowed to pit 45 minutes, 65% salt water. Chlorides 110,000 PPM. Closed 30 minutes. SIP: 475# Opened to test tank at 5:30 P.M.

6-22-53: PBTD 5680'. Packer failed and oil cut mud started very light flow out of casing. Opened by-pass on PT tool and flow increased out casing. Closed rams. No pressure built up on casing. (Note: mud weight had dropped to 9.6# per gallon, built mud weight to 10.1# per gallon.) Pulled PT Tool out hole. Ran 182 joints (5598.75') E.U.E. 4.70# J-55 8 rd. thd. R-2 American tubing with 3.35' perforated tubing sub bull-plugged on bottom; landed 9.08' below RKB, spaced as following:

Landed below RKB	9.08'
Top joint tubing	31.25'
181 joints tubing	5567.50'
Perforated sub bull-plugged	3.35'
Bottom tubing	5611.18'

Displaced mud with water. Opened to pit at 2:45 A.M., flowed very small stream of wash water for 2 hours with slow steady increase in volume. Swabbed 1½ hours wash water with trace of oil.

6-23-53: PBTD 5680'. Swabbing 24 hours, 10 to 12 barrels fluid per hour, 85 to 95% water. Chlorides 90,000 PPM. and mud. Fluid level 3000'.

6-24-53: PBTD 5680'. Swabbed 24 hours, 8 to 10 barrels fluid per hour, 80 to 90% water and mud. Fluid level 3500'. Released rig at 1:00 P.M., 6-23-53.

6-25-53: PBTD 5680'. Swabbing. Swabbed from 8:00 A.M. to 9:00 A.M., 8 to 10 barrels per hour, 80 to 90% water and mud. Stopped swabbing from 9:00 A.M. to 3:00 P.M., well dead. Started flowing at 3:00 P.M. with weak heads. Swabbed 4:00 P.M. to 10:00 P.M., last trip with swab, 50 to 80% water with very little show of mud. Shut in 9 hours. TSIP: 450# CSIP: 850# Opened to pit, flowed off heads of clean oil, decreased to weak flow by heads. Made three trips with swab, 1½ hours. First trip, 1500' clean oil and 2000' (90%) salt water; Second trip, 3000', 96% salt water; third trip, 94% salt water.

6-26-53: PBTD 5680'. Shut in 9:00 A.M. to 1:00 P.M. Opened to test tank at 1:00 P.M. to 6:00 P.M., flowed 7½ barrels fluid, 70 to 85% water. Pumped oil in casing to displace water in tubing. Pumped 15 barrels crude oil into formation at 2250# bleed down pressure, after pumping, 1500#. Opened to test tank at 8:00 P.M. to 10:00 P.M., flowed 16 barrels flush oil at end of test with very weak heads. Closed 10:00 P.M. to 7:00 A.M. TSIP: 700# CSIP: 900#. Flowed from 7:00 A.M. to 8:00 A.M., flush oil with very weak head at end of hour.

6-27-53: PBTD 5680'. Re-acidized A Zone, 5605-5613, with 200 gallons mud acid with 2 barrels crude oil ahead of acid. Displaced oil at 2100# maximum pressure. Displaced acid at 1500# at rate of 1½ barrels per minute. Pressure bled down 600#. Flowed spent acid 15 minutes, turned to test tank at 10:00 A.M. 30 minute test, open flow, 27.13 barrels fluid, 70% salt water. 4 hour test, 14/64" choke, 63.74 barrels fluid, 75% salt water, TFP: 290# CP: 875#. 14½ hour test, 11/64" choke, 201.81 barrels fluid, 64% salt water, TFP: 350# CP: 925#. 24 hours, 11/64" choke, 213.81 barrels water, 120.27 barrels oil.

6-28-53: PBTD 5680'. Shut in to build tank battery. Flowed 9.11 barrels fluid per hour, 65% water with 9/64" choke, TFP: 350# CP: 950# TSIP: 450#. To drop from reports.

COMPLETION TESTS

A Zone

Hours	Choke	FP	BS&W	Fluid	Water	Oil	CP	Date
1/2	O.F.	0	70%	27.13	18.99	8.14	0	6-27-53
4	14/64	290	75%	63.74	47.80	15.94	875	6-27-53
14½	11/64	350	64%	201.81	129.14	72.67	925	6-27-53
3	11/64	350	55%	32.73	18.00	14.73	925	6-28-53
15	9/64	350	65%	136.75	88.89	47.86	950	6-28-53

TSIP: 450# CSIP: 950#

B I T R E C O R D

No.	Make	Size	Type	Ser.No.	From	To	Footage	Hours	Cond.
1	Hughes	12 1/4	OSC-3	- *	0	910	910	20	M.D.
2	"	8 3/4	"	47819	910	2385	1475	24	D.
3	"	"	OSC-1	10598	2385	3138	753	17 1/2	D.
4	"	"	"	65236	3138	3381	243	12	D.
5	Reed	"	2 T	89394	3381	3447	66	11	M.D.
6	Hughes	"	OSC-1	19316	3447	3609	162	14	D.
7	"	"	OSC	45752	3609	3715	106	11 3/4	M.D.
8	"	"	"	12592	3715	3895	180	17 1/2	M.D.
9	"	"	"	12605	3895	4035	140	12	M.D.
10	"	"	"	12597	4035	4245	210	29 3/4	D.
11	"	"	"	45753	4245	4450	205	28 1/4	D.
12	"	"	"	14168	4450	4585	135	21	M.D.
13	"	"	OWV	23329	4585	4820	235	31 1/2	V.D.
14	"	"	"	38008	4820	4975	155	20	M.D.
15	"	"	"	98954	4975	5088	133	16	M.D.
16	"	"	"	11063	5088	5281	193	24 1/2	M.D.
17	"	"	OSC	59546	5281	5402	121	16	M.D.
18	"	"	"	99340	5402	5508	106	18 1/2	D.
19	"	"	"	90716	5508	5600	92	11 1/2	M.D.
CB#1	Christensen	7 7/8	Dra.	J1847	5600	5635	35	17 3/4	G.
"	"	"	"	" *	5635	5645	10	4 1/2	G.
20	Hughes	"	OWS	80272	5645	5720	75	10	G.
CB#1	Christensen	"	Dra.	J1847*	5720	5776	56	20 1/2	G.
21	Hughes	"	OWS	80267	5776	5880	104	16 1/2	M.D.
CB#1	Christensen	"	Dra.	J1847*	5880	5938	58	26 1/2	M.D.

ELECTRO LOG DATA

TYPE OF LOG	INTERVAL LOGGED
Schlumberger Electric Logs:	
Electrical Survey 2"	80-5938'
Electrical Survey 5"	5260-5938'
Microlog 5"	2000-5935'
Microlog 25"	5400-5935'
Microlaterolog 5"	5400-5935'
Microlaterolog 25"	
McCullough Tool Company	
Radicactivity Log	5400-5930'

TENATIVE TOPS

	Depth	Datum	Thickness
Judith River	830	+1349	
Niobrara	2060	+ 119	
Greenhorn	2411	- 232	
Graneros	2613	- 434	
Upper Muddy	2768	- 589	
Muddy	2985	- 806	
Dakota Silt	3206	-1027	
Morrison	3573	-1394	
Swift	3648	-1469	
Rierdon	3978	-1799	
Piper Shale	4332	-2153	
Piper Limestone	4411	-2232	
Gypsum Springs	4468	-2289	
Spearfish	4660	-2481	
Amsden	4795	-2616	
Heath	4956	-2777	
Otter	5106	-2927	
Kibbey	5247	-3068	
Kibbey Limestone	5405	-3226	
Madison	5500	-3321	
A-1	5579	-3400	2
A-2	5592	-3413	4
A-3	5606	-3427	14
A-4	5620	-3441	22
B-1	5748	-3569	10
B-2	5767	-3588	14
B-3	5787	-3608	7
B-4	5820	-3641	4
B-5	5857	-3678	?
C-1	5896	-3717	?
C-2	5914	-3735	9

C O R E D E S C R I P T I O N S

Core No. 1

5600-5635 Rec. 19'

C. T. 26, 46, 47, 26, 28/ 41, 37, 49, 49, 57/ 41, 35, 29, 34, 35/ 45, 30, 25, 25, 17/ 23, 20, 12, 13, 21/ 21, 23, 45, 25, 17/ 15, 15, 25, 15, 20/

6' Anhydrite: light gray to white, medium soft, amorphous, numerous 1 inch to 2 inch streaks of olive gray, medium hard, amorphous, argilaceous dolomite. No show.

*12' Limestone: brownish-gray, fine crystalline to amorphous, very hard, dense, except for numerous short, tight, irregular fractures, very faint oil odor and bright, light milky yellow fluorescence along an occasional fracture; sections of unit are broken up and washed so that it is not possible to recognize any show. Fracturing in this unit is very poor as compared to most "A" Zones in E.P.U.

* 1' Limestone: dark brownish-gray, oolitic, soft, good porosity and permeability, fair oil odor on fresh break; bright milky fluorescence, fairly good oil taste.

*Analyzed by Chemical and Geological Lab.(Full Diameter.)

Core No. 2

5635-5645 Rec. 9½'

C. T. 27, 23, 29, 27, 36/ 26, 26, 25, 22, 24/

* 3'6" Limestone: dark brownish-gray, oolitic, soft, resinous luster, numerous small 1/8" oolites in a light, medium gray, microcrystalline ground mass, entire unit is very porous and permeable, faint oil odor on fresh break, bright milky white fluorescence throughout, entire unit looks wet.

5'0" Anhydrite: light gray, medium soft, amorphous to microcrystalline, numerous fairly thick streaks of brownish-gray, fine crystalline limstone. No show.

0'6" Dolomite: light brownish-gray, microcrystalline, hard, dense, except for single very tight incipient vertical fracture extending through the length of the unit. No show.

* Analyzed by Chemical and Geological Laboratories. (Full Diameter).

Core No. 3

5720-5778 Rec. 58'

C. T. 37, 23, 30, 24, 23/ 23, 23, 22, 35, 38/ 27, 35, 28, 26, 31/ 33, 28, 16, 15, 14/ 18, 20, 23, 22, 27/ 25, 23, 16, 14, 26/ 19, 14, 13, 11, 11/ 19, 24, 23, 20, 20/ 21, 23, 24, 23, 19/ 14, 10, 13, 15, 15/ 15, 18, 19, 16, 20/ 24

4'6" Anhydrite: medium light gray, fine crystalline, medium soft, dense, numerous irregular thin black calcareous shale partings. No show.

1'6" Dolomite: medium gray, very fine crystalline, medium hard, very slight porosity, matrix with numerous short, fairly well developed open vertical fractures with some salt along fracture planes. No show.

2' Anhydrite: light gray, fine crystalline, dense, numerous thin black dolomitic shale partings. No show.

1' Dolomite: medium dark gray, amorphous to microcrystalline, very hard, dense. No show.

1' Anhydrite: same as above 2' unit. No show.

2' Dolomite: same as above 1' unit. No show.

2' Anhydrite and Dolomite: light gray anhydrite and medium dark gray dolomite, medium hard, dense; anhydrite occurs as large inclusions in a dolomitic matrix. No show.

3' Anhydrite: dark gray, very fine crystalline, medium hard, dense. No show.

4' Anhydrite; light gray, very fine crystalline, very soft, very salty with numerous fairly large vugs caused by solution of salt. No show.

7' Anhydrite: light gray, very fine crystalline, medium hard, dense. No show.

2'6" Limestone: medium gray, fairly soft, very slight porosity, questionable permeability, very slightly oolitic with numerous small oolites in a round gray, soft microcrystalline matrix; faint oil odor on fresh break, uneven, dull golden-yellow fluorescence.

2'6" Limestone: brownish-gray, amorphous to microcrystalline, very hard, very slight porosity, occasional short, tight, vertical fractures, faint oil odor on fresh break and along fracture planes; uneven dull golden-yellow fluorescence in matrix with even dull golden-yellow fluorescence along fracture planes.

Core No. 3 continued
5720-5776 Rec. 53'

4' Limestone: medium brownish-gray, fine to medium crystalline, fair intercrystalline porosity, questionable permeability, fair oil odor on fresh break, uneven dull golden yellow fluorescence.

9' Anhydrite: light gray, fine crystalline, medium hard, dense; some thin irregular black calcareous shale partings. No show.

*10' Limestone: dark brownish-gray, fine to medium crystalline, medium soft, very slight porosity, questionable permeability, numerous small brown calcite crystals, fair oil odor, uneven dull golden-yellow fluorescence in matrix, occasional short, fairly well developed vertical fractures with fair oil odor and dull even golden-yellow fluorescence.

* Analyzed by Chemical and Geological Laboratories. (Full diameter).

- - - - - - - - - - - - - - - - - -

Core No. 4

5880-5938 Rec. 57'

C. T. 30, 40, 40, 35, 35/ 40, 35, 30 28, 27/ 30, 27, 37, 28, 33/ 27, 28, 29, 37, 33/ 30, 32, 31, 29, 38/ 28, 16, 19, 28, 27/ 32, 30, 24, 18, 14/ 13, 16, 15, 10, 11/ 14, 26, 28, 19, 23/ 19, 20, 24, 26, 26/ 21, 27, 33, 27, 35/ 40, 35, 35.

7'6" Limestone: brownish-gray, fine to medium crystalline, hard, dense; occasional short, very tight incipient vertical fractures, occasional 1/8" clear calcite crystals, very faint sulfur odor on fresh break. No show.

6" Dolomite: light gray, amorphous, medium hard, dense except for several short, very tight, incipient vertical fractures, unit looks wet. No show.

3' Limestone: brownish-gray, fine crystalline, very hard, occasional long tight, vertical fractures cemented with selenite. No show.

5' Dolomite: dark gray to black, amorphous, very hard, brittle, very dense with exception of occasional long, very tight, incipient vertical fracture cemented with selenite, 1" streak of black calcareous shale followed by 3" of dolomite and dark gray anhydrite occuring as numerous very thin streaks in very top of unit. No show.

Core No. 4 continued
5880-5938' Rec. 57'

12' Limestone: dark brownish-gray, fine to medium crystalline, very hard, dense, except for occasional long tight incipient vertical fracture cemented with selenite, numerous black stylolitic partings. No show.

7' Limestone: light gray in top becoming dark brownish-gray at base, fine to medium crystalline, very hard, dense except for occasional thin, tight vertical fracture, very faint sulfur odor along fracture planes and on fresh break, very slight trace of fluorescence along one fracture, no oil odor, otherwise no show.

9' Limestone: brownish-gray, very fine to microcrystalline, very hard, very slight intercrystalline porosity, questionable permeability; occasional very tight, incipient vertical fracture; fracture planes evenly covered with small selenite crystals; single fairly well developed open vertical fracture in top 2' of unit; faint oil odor on fresh break; occasional spot of dull golden-yellow fluorescence.

13' Limestone: brownish-gray, fine crystalline, very hard, dense, occasional very thin tight incipient vertical fracture cemented with selenite, very faint sulfur odor on fresh break. No show.

D R I L L S T E M T E S T S

DST #1 5606-5616: Halliburton tool, straddle packers, 5/8" bottom choke, no water cushion; tool open with fair bubble for 45 minutes, dead last 45 minutes of test. Tool open for 2 hours, closed 20 minutes. Recovered 10 feet rat hole mud. IBHFP: 0#; FBHFP: 0#; BHSIP: 0#; Hydro: 3470#. Date: 5-30-53.

DST #2 5742-5757: Straddle packers, 5/8" bottom choke, no water cushion; tool open 4 hours, closed 20 minutes; tool open with very weak blow and it lasted throughout test. Recovered: 10 feet free oil, 186 feet muddy salt water. Chlorides: 85,000 ppm. IBHFP: 0#; FBHFP: 65#; BHSIP: 2230#; Hydro: 3212#. (Bottom packer held okay) Date: 5-31-53.

DST #3 5761-5776 5/8" bottom choke, no water cushion; tool open 4 hours, closed 20 minutes; tool open with very weak blow which increased to strong blow at end of test. Recovered: 270 feet muddy salt water, 1830 feet black sulfur water. Chlorides: 110,000 ppm. IBHFP: 240#; FBHFP: 965#; BHSIP: 2330#; Hydro: 3212#. Date: 6-1-53.

DST #4 5913-5938 5/8" bottom choke, no water cushion. Halliburton packer set at 5913 feet; tool open for 3 hours, closed for 20 minutes; tool open with very weak blow which increased to good blow at end of test. Recovered 270 feet gas, 150 feet slightly oil and gas cut mud, 270 feet muddy water with slight oil show and sulfurous odor. Chlorides: 31,000 ppm. IBHFP: 65#, BHSIP: 2975#, FBHFP: 125#; Hydro: 3420#.

MUD PROGRAM SUMMARY

Mud Additives Used: Baroid 147 sacks; Aquagel 254 sacks; Caustic Soda 44 cans; Driscose 10 sacks; Lime 6 sacks; Barafos 3 sacks; Tannex 91 sacks; Zeogel 20 sacks; Sodium Bicarbonate 2 sacks.

Total Cost:	$3,354.99
Drayage:	149.50
Total Mud Cost:	$3,504.49

Surface hole was drilled to a depth of 1010 feet with water, Aquagel and a few sacks of lime. 9 5/8 inch casing was set at 1000 feet with 400 sacks of regular cement without difficulty. Drilled out from under surface pipe with water to approximately 3400 feet where small additions of Aquagel were made while drilling to a depth of approximately 3900 feet. At this depth conversion to a high Ph mud was started with regular additions of Tannex and Caustic Soda being made to a total depth of 5938 feet. 5 1/2 inch casing was run and cemented with 250 sacks of Pozmix without difficulty. Two sacks of Sodium Bicarbonate were added while drilling out cement to offset any mud weight loss from cement contamination.

Mud characteristics while drilling to a total depth were as follows:

Depth	Weight	Viscosity	Water Loss	Ph
3645	10.1 #/gal.	37 sec.	11.6 cc.	9.0
4151	10.5 #/gal.	38 sec.	8.0 cc.	8.0
4450	10.5 #/gal.	43 sec.	7.2 cc.	9.0
4799	10.2 #/gal.	40 sec.	12.2 cc.	11.0
5016	10.5 #/gal.	41 sec.	12.0 cc.	11.0
5495	10.8 #/gal.	43 sec.	14.0 cc.	11.0
5632	10.8 #/gal.	43 sec.	11.0 cc.	11.0
5748	10.6 #/gal.	43 sec.	12.0 cc.	11.0
5891	10.7 #/gal.	43 sec.	17.0 cc.	11.0
5938	10.6 #/gal.	41 sec.	17.0 cc.	10.5

SAMPLE DESCRIPTION

2000-50 Shale, light gray, medium firm, micaceous, light gray sandy shale; trace of light gray, fine to medium grained sandstone; trace of soft white sandy bentonite; trace of aragonite.

2050 Sample Top: Niobrara

2050-2150 Shale: as above with medium gray, chunky calcareous shale with numerous small tan specks; trace of pyrite, trace of aragonite.

2150-2320 Shale: as above with trace of dense brown amorphous, fine crystalline limestone

2320-2480 Shale: light gray and dark gray, firm, slightly micaceous, slightly pyritic; trace of light gray bentonite.

2480 Sample Top: Greenhorn

2480-2610 Shale: dark gray, firm, calcareous, slightly micaceous; occasional small tan speck, trace of light gray, slightly sandy shale, trace of aragonite

2610 Sample Top: Graneros

2610-2750 Shale: dark gray, fairly soft, slightly micaceous; trace of soft white to light gray bentonite, trace of pyrite.

2750 Sample Top: Upper Muddy

2750-2970 Shale: as above with trace of soft, medium grained, muddy siltstone; trace of soft white to light gray bentonite; trace of pyrite.

2970 Muddy Sand

2970-2980 Shale: as above with some soft, medium gray, muddy siltstone; trace of medium gray, fine grained, porous, slightly glauconitic sandstone; sand grains well sorted and well rounded.

2980-3020 Sandstone: medium gray, fine grained, porous, permeable, slightly glauconitic, salt and pepper appearance, well sorted and rounded; some dark gray, firm, calcareous shale; some soft, medium gray siltstone.

SAMPLE DESCRIPTION

3020	Sample Top: Skull Creek
3020-3080	Shale: dark gray, medium firm, chunky; siltstone, light gray, soft slightly calcareous, trace of bentonite, trace of light gray sand as above.
3080-3200	Shale: dark gray, chunky; shale very light gray, soft, trace of light gray sand as above.
3200	Sample Top: Dakota
3200-3400	Sandstone: light gray to white, fine grained, subrounded, well cemented; shale, light and dark gray, some fissle gray shale, trace of light brownish-gray, slightly calcareous siltstone.
3400-3460	Shale: dark gray and light gray, trace of light grayish-brown siltstone, slight trace of sandstone as above.
3460-3600	Sandstone: gray to white, fine grained, subrounded, medium cementation, dark and light gray shale, trace of gray siltstone.
3600	Sample Top: Morrison
3600-3630	Siltstone: light gray, soft, slightly calcareous, dark and light gray shale, trace of sand as above.
3680	Sample Top: Swift
3680-3780	Sandstone: light gray to white, very fine grained, medium cementation, glauconitic, shale dark gray, splintery, shale light gray, soft, silty.
3780-3990	Shale: dark gray, splintery, shale light gray, silty, slightly calcareous, trace of sandstone as above, scattered traces of pyrite.
3990	Sample Top: Rierdon
3990-4030	Shale: dark gray, splintery and chunky; shale, medium gray, soft, slightly calcareous, trace of sandstone, very fine grained, light gray, calcareous
4030-4130	Sandstone: medium gray, very fine grained, well cemented, slightly calcareous; shale, medium gray, soft, calcareous, slightly micaceous; shale, dark gray, splintery.
4130-4325	Shale; light gray, splintery, calcareous; shale, dark gray, splintery with scattered traces of pyrite, trace of sandstone as above.
4325-4340	Shale and sandstone as above, trace of medium brown, dense limestone.

SAMPLE DESCRIPTION

4340	Sample Top: Piper Shale
4340-4350	Shale, sandstone and limestone, dense as above with trace of dark brownish-red shale.
4350-4400	Shale: medium gray, slightly calcareous, micaceous; shale, light gray, splintery, trace of dark brownish-red shale.
4400	Sample Top: Piper Limestone
4400-4430	Limestone: dark brown, amorphous to fine microcrystalline, shale as above.
4480	Sample Top: Gypsum Springs
4480-4560	Shale: medium gray, chunky; shale, light gray, splintery, calcareous; shale, dary redish-brown with trace of gypsum, some dark brown, fine crystalline limestone; shale, dark gray, silty, splintery, scattered traces of pyrite,
4560-4590	Shale: dark gray, splintery; shale, medium gray, slightly micaceous and pyritic, trace of red chunky shale; dolomite, light brownish-gray, microcrystalline, dense; limestone, dark brown, microcrystalline, resinous.
4590-4640	Shales as above; limestone, light gray, amorphous, dense; dolomite, gray to white, dense.
4640-4660	Shale: as above and some light green shale, traces of limestone and dolomite as above, trace of bentonite.
4660-4670	Shale as above, trace of limestone as above, some white, dense anhydrite
4670	Sample Top: Spearfish
4670-4700	Sandstone: red, very fine grained to silty, poorly cemented, sub-rounded; shale, medium gray, soft, fissle, calcareous; trace of limestone, medium brown, microcrystalline, dense; shale, dark red, chunky, trace of black shale.
4700-4740	Shale: medium gray, soft, fissle, calcareous, some sandstone, dense as above.
4740-4770	Same as above with only a slight trace of red sandstone; some red shale.

4770 Sample Top: Amsden

4770-4820 Shales as above; dolomite, light brownish-gray to pink, fine crystalline, dense.

4820-4840 Dolomite: pink, fine crystalline, dense; trace of limestone, light gray, very fine crystalline, dense; shale, medium gray, calcareous; shale, black, splintery, trace of red, chunky shale.

4840-4970 Shale: light gray, fissle, calcareous; shale, purple, slightly calcareous; shale, medium gray, pyritic; trace of limestone, medium brownish-gray, amorphous, dense increasing sharply at 4890-4930, trace of light green shale.

4970 Sample Top: Heath

4970-5050 Shale: brick red, soft, chunky; shale, light greenish-gray, fissle, calcareous; shale, purple, slightly calcareous, trace of light brownish-gray, fine crystalline dolomite, limestone, some brownish shale.

5050-5080 Shale: brick red, soft, chunky; shale, light gray, soft, calcareous, trace of shale, purple, slightly calcareous, trace of limestone, light gray, fine crystalline, dense.

5080-5100 Shales and limestone as above; shale, black, fissle.

5100-5120 Shale: medium gray, soft, fissle, calcareous; shale, dark gray, chunky; shale, brick red, silty, calcareous; shale, brick red, fissle, very slightly calcareous.

5120-5140 Shales as above; dolomite, light brownish-gray, very fine crystalline, lime, trace of purple shale.

5140 Sample Top: Otter

5140-5200 Shale: bright green, splintery in upper 20'; limestone, light gray, brown, very fine crystalline; other shales as above, some brown shale, some shale green, calcareous, ankerites

5200-5250 Red, green, brown, and gray shale as above; shale, dark gray, chunky, limy; limestone, medium gray, brown, very fine crystalline, dolomitic; shale, light purple, ankerites.

5250-5270 Red, gray, purple and brown shale as above; trace of sandstone, brownish-red, very fine grained, silty, poorly cemented.

5270-5290 Red, green, brown, purple shale as above.

SAMPLE DESCRIPTION

5290 Sample Top: Kibbey Sandstone

5290-5350 Red, gray, and purple shale as above (red in abundance); sandstone, red, very fine grained, medium cementation, subrounded, calcareous, some black chunky shale.

5350-5380 Sandstone: red to brown, fine grained, subrounded, poor sorting, slightly calcareous; shale, brick red, calcareous; shale, brown, calcareous; shale, medium gray, soft, calcareous; limestone, dark gray.

5380-5400 Shale as above; sandstone as above in much less quanity and very fine grained.

5410-5430 Shale as above with a trace of sandstone as above.

5430 Sample Top: Kibbey Limestone

5430-5450 Red and gray shale as above, some sandstone as above; limestone, brownish-gray, microcrystalline, dense, dolomitic inclusions.

5450-5460 Shale as above; sandstone as above in more abundance, some limestone as above.

5460-5510 Shale and sandstone, as above with trace of limestone as above.

5510 Sample Top: Madison

5510-5530 Shale: brick red, splintery, calcareous; shale, medium gray, fissle, calcareous; shale, black, chunky, calcareous ; trace of light brown limestone.

5530-5540 Shales as above, trace of soft white anhydrite, some grayish-brown limestone.

5540-5580 Anhydrite: light gray, very fine crystalline, dense; red, gray, and black calcareous shales; some brownish-gray, dense limestone.

5580-5600 Limestone: dark gray, very fine crystalline, some anhydrite as above; red, gray and black calcareous shale.

5600-5635 Core #1: Recovered 19 feet.

5635-5645 Core #2: Recovered 9½ feet.

5645-5690 Anhydrite: light gray, medium hard, fine crystalline limestone.

5690-5720 Limestone: dark brownish-gray, fine crystalline, hard, dense, some soft, white, fine crystalline anhydrite; trace of light gray, dense, fine crystalline dolomite.

SAMPLE DESCRIPTION

5720-5776 Core #3: Recovered 56 feet.

5776-5785 Limestone: brownish-gray, amorphous to microcrystalline, medium hard, very slight porosity; some light gray amorphous dolomite, trace of soft white anhydrite.

5785-5800 Dolomite: light gray, medium hard, porous, very sandy with numerous fairly large rounded sand grains; some brownish-gray, amorphous limestone, trace of soft, white anhydrite.

5800-5880 Limestone: brownish-gray, fine crystalline, medium hard, dense; some medium gray, fine crystalline, dense dolomite.

5880-5938 Core #4: Recovered 57 feet.

T.D. = 5938' Driller = 5939' Schlumberger.

Location: C SW-SW Sec. 12-T28N-R51E
Spacing - 160 acres
Elevation: 2179 K.B. - 2166 Gr.
Spudded: 5-[illegible]-57
Completed: 6-23-57
T.D.: 5939 Schl = 5938 Drlr
Prod. Zones: A-1 5605-13,

Schlumberger Tops

	Depth	Datum	Thickness
Judith River	830	+1349	
Greenhorn	2411	- 232	
Muddy Sd	2985	- 806	
Dakota Silt	3206	-1027	
Piper Ls	4411	-2232	
Amsden	4795	-2616	
Heath	4956	-2777	
Otter	5106	-2927	
Kibbey Sd	5247	-3068	
Kibbey Ls	5405	-3226	
Madison	5500	-3321	
A-1	**5579	-3400	2'
A-2	**5592	-3413	4'
A-3	5606	-3427	14'
A-4	*5620	-3441	22'
B-1	5748	-3569	10'
B-2	5767	-3588	14'
B-3	5787	-3608	7'
B-4	5820	-3641	4'
B-5	5857	-3678	?
C-1	**5896	-3717	?
C-2	5914	-3735	9'

**Probable prod. Zones (From DST structural position, etc.

*Shows

Drill Pipe Corrections (Made)
5405 Driller = 5405 SLM (0')

Coring Intervals:
#1 5600-5635 Rec. 19' A-3 & 4
#2 5635-5645 Rec. 9½' A-4
#3 5720-5776 Rec. 56' B-1 & 2
#4 5880-5938 Rec. 57' C-1 & 2

Drill Stem Tests:
DST #1 5606-16' A-3. Op 2 hrs. SI 20 min. Rec. 10' rat hole mud. IBHFP 0 FBHFP 0 BHSIP 0 Hydro 3470.
DST #2 5742-57 B-1 Op 4 hrs, SI 20 min. Rec. 10' free oil, 186' muddy s.w. w/tr gas. Chl. 85,000ppm. IBHFP 0 FBHFP 65 BHSIP 2230 Hydro 3212.
DST #3 5761-76' B-2 Op 4 hrs SI 20 min. Rec. 270' muddy s.w. w/tr gas, 1830' blk sulf wtr. Chl. 110,000 ppm. IBHFP 240, FBHFP 965 BHSIP 2380 Hydro 3212.
DST #4 5913-38' C-2 Op 3 hrs SI 20 min. Rec. 270' gas, 150' sl o & g cut mud, 270' muddy wtr w/oil show & sulf odor. Chl 31,000 ppm. IBHFP 65, FBHFP 125 BHSIP 2975 Hydro 3420.

History Subsequent to Completion:
None

PENKOTA WIRELINE SERVICES, INC.
REMIT PAYMENT TO:
P.O. BOX 1952
WILLISTON, ND 58802-1952

Invoice

DATE	INVOICE #
10/01/1999	3351

BILL TO:

Murphy Oil USA Corporation
PO Box 547
Poplar, MT 59255

Customer: #4070

SHIP TO:

Murphy Oil USA Corporation
PO Box 547
Poplar, MT 59255

Customer: #4070

P.O. NUMBER	TERMS	REP	SHIP	VIA	F.O.B.	PROJECT
4133	Net 30	BB	10/01/1999	TR #38	ROOSEVELT MT	

QUANTITY	ITEM CODE	DESCRIPTION	PRICE EACH	AMOUNT
		EPU #24		
1	1000-110	SERVICE CHARGE		
1	2300-015	OWEN 4.24" CIBP		
1	2300-XXX	SET CIBP @ 5560'		
4	2300-050	DUMP BAIL 4 SACKS CEMENT ON CIBP		
		TOTAL DISCOUNTED PRICE	2,550.00	2,550.00

TOTAL $2,550.00

THIS INVOICE DUE AND PAYABLE IN WILLISTON, WILLIAMS COUNTY, NORTH DAKOTA WITHIN 30 DAYS OF INVOICE DATE.

PRODUCTION &
INJECTION DATA